Performance Perspective

Report #PP-2004-01 **OFFICE OF CITY AUDITOR** **May 17, 2004**

Performance Perspective is a periodic newsletter issued by the Office of City Auditor. The purpose of these newsletters is to highlight general management principles or to disclose successful, useful or problematic program management issues. If you have any questions or comments about this newsletter, please contact Susan Cohen, City Auditor, by e-mail at susan.cohen@seattle.gov or telephone at (206) 233-1093.

Impacts of Climate Change

Will Seattle Be Prepared?

Background

The earth's temperature has been gradually warming since the mid-19th century. The majority of climate scientists believe that unusually high temperatures during the past 50 years can be attributed to the by-products of industrial society, including the carbon dioxide emitted by our cars and power plants.

During the 20th century, temperatures for local areas in the Pacific Northwest increased an average of 1.5 degrees Fahrenheit. University of Washington scientists expect regional temperatures to rise an average of 2.5 degrees during the next two decades. Potential Pacific Northwest impacts include a significant reduction in the region's snowpack, rising sea levels, droughts, and increased risk of mudslides and wildfires. Because many of the anticipated climate impacts are based on models with large geographic scales, current scientific research is being conducted to better understand potential impacts on a smaller, local scale.

What Has the City Done to Address Climate Change?

Responding to global climate change has been a City priority since the early 1990s. Seattle's Office of Sustainability and Environment has served as a source of leadership and information in the City's preventive efforts to reduce its greenhouse gas emissions. From 1990 to 2000, the City reduced greenhouse gas emissions attributable to its operations by 48 percent, and expects this trend to continue.

In 2000, the Mayor and City Council adopted a resolution that directed Seattle City Light to implement a resource strategy that results in zero net greenhouse gas emissions.

In 2003, Seattle City Light signed a contract to fund its first greenhouse gas mitigation project in City Light's continuing effort to offset all emissions associated with its power purchases and utility operations. Following Seattle's example, many other local governments in the United States are also taking action to reduce emissions.

According to the Intergovernmental Panel on Climate Change, a joint panel of the United Nations and World Meteorological Organization, strategies to mitigate greenhouse gas emissions may not be enough to avoid future problems. Strategies to minimize risks by adapting to climate variability might also need to be a component of the City's response to climate change.

The Office of City Auditor's Role

Determining how City departments are managing risks is an important responsibility of the Office of City Auditor. Integrating information on climate impacts into long-range planning is a type of risk management. How will City departments respond to climate change? What new risks may emerge as a result of climate change?

We recently initiated a review of Seattle City Light, Seattle Public Utilities, and the Seattle Department of Transportation to determine how these City departments are incorporating climate change impacts into their long-term planning, and what the financial impacts will be. In contrast to the Office of Sustainability and Environment's focus on further mitigation and prevention of greenhouse gas emissions, we will focus on how these departments are planning to address risks or take advantage of opportunities that arise due to future climate change.

"Despite the political rhetoric on the uncertainties of the science, there is little debate among the scientific community on the reality of climate change."

—"Climate Change in Our Own Backyard, *Seattle Times* , February 13, 2004

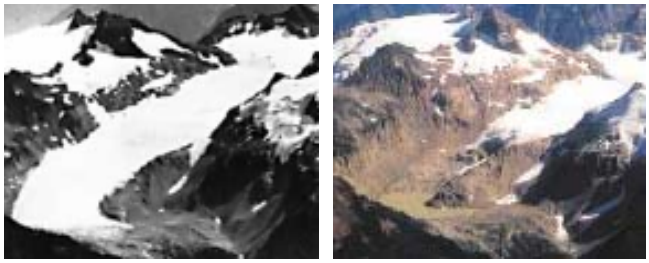
Impacts of Climate Change in the Pacific Northwest

Local scientists anticipate that the rising temperature in the Pacific Northwest will significantly impact regional natural resources by 2040. Although future precipitation patterns are more difficult to predict than temperature patterns, impacts in Northwest states are likely to include:

Changes in Water Resources and Salmon Habitat

- Decreased mountain snowpack and earlier snowmelt;
- Higher winter stream flow, earlier peak stream flow, and lower summer stream flow in rivers that depend on snowmelt;
- Decreased water for irrigation, fish, and summertime hydropower production (though specific impacts to each watershed are difficult to predict);
- Potential increased urban demand for water and increased conflict over water resources; and
- Higher salmon mortality rates due to winter floods, reduced water levels during summer, and warmer water.

1928 *2000*



The South Cascade Glacier, outside North Cascades National Park, has been melting since 1928.

Changes in Forests

- Increased seedling regeneration and tree growth in high snow forests, but decreased growth and potential increases in forest fires in dry forests;
- Overall forest growth will eventually decrease as rising temperatures overwhelm trees' capacity to utilize higher levels of winter precipitation and carbon dioxide; and
- Potential for extinction of local plant populations and loss of biological diversity.

Changes along the Coasts

- Increased coastal erosion, beach loss, landslides, and coastal flooding due to rising sea levels and increased winter stream flow from coastal watersheds; and
- Permanent inundation, especially in South Puget Sound near Olympia.

These changes are expected to occur during the next four decades, and some changes are already evident. Spring snowmelt already begins two weeks earlier in the Pacific Northwest than it did in 1948.

The Importance of Planning for Climate Change

According to the University of Washington's Climate Impacts Group, preparing for climate change is particularly important in the Pacific Northwest given our dependence on climate-sensitive natural resources. Climate change presents both challenges and opportunities for the region. One opportunity, for example, would be the potential to increase hydroelectric energy generation during the winter to take advantage of increased precipitation and stream flow. However, increased stream flow would also increase risks of flooding and mudslides.

The City's two utilities, Seattle City Light and Seattle Public Utilities, have already begun to develop partnerships with the scientific community and have commissioned studies related to the impacts of climate change. All City agencies will eventually need to begin incorporating climate change into traditional planning processes. Planning for future climate change will better enable the City and other local and regional jurisdictions to take advantage of any opportunities and minimize risks.

Again, because of the importance of sound risk management practices, we are working to identify how the City's two utilities and the Seattle Department of Transportation are incorporating climate change risks into their long-term planning.

"Although Western energy rates have stabilized, experts say the market remains volatile…And scientists say that global warming over time will adversely affect Northwest snowpack, which ultimately will affect hydropower dams."

—"Fresh Faces, Renewed Focus for Seattle City Light," *Seattle Times*, February 23, 2004